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ABSTRACT

In a speech given at the annual convention of the National Association of Educational Broadcasters, the Commissioner of Education discusses the need to establish educational technology as a resource to be used to effect significant and revolutionary improvement in existing forms of education. With television and other media, teachers can utilize excellent programming in the classroom at a relatively low cost, an important asset because the rising costs of education have occurred at the same time that the public is demanding more individualized and personalized instruction. Educational TV is expensive but because of the wide viewing audience the actual cost per child of a program list "Sesame Street" is one cent per child per hour. "Electric Company," "Ripples" and "Patterns in Arithmetic" are among other educational TV programs cited. Also discussed are future Office of Education plans for advancing the cause of edcuational telecommunications. (MK)

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EDUCATIONAL TELECOMMUNICATIONS --- THE FUTURE IS NOW*

By S. P. Marland, Jr.
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It is the privilege of every speaker to start things off by assuring his audience in solemn tones that he and they meet at a fateful moment of history, and that their common affairs, moreover, have arrived at a time of crisis and a moment of decision.

Of course one sounds this apocalyptic note at the risk of creating an instant credibility gap. Oratorical fulminations too easily tend to climb to the same pitch of intensity whether the subject be human rights or instant tea.

Yet I do not hesitate to cast this message on such a note this morning. When we consider our subject --- educational technology --- we can easily and correctly speak of impending revolution and corresponding crisis decisions. This is not manufactured drama but simply the situation. For these are dramatic times in the history of education in the United States --- and particularly in the short but interesting annals of educational technology. And we are faced by any number of crises --- though the one with particular relevance to this meeting is the ever-present but worsening crisis of finance. Finally, it seems that the time is now to make a strong affirmative decision that technology will no longer be simply an interesting curiosity in education --- to be wondered at, to be extolled in rhetoric as possessed of a great future, but not to be relied

PS 005180

*Before the annual convention of the National Association of Educational Broadcasters, Fontainbleau Hotel, Miami Beach, Florida, Tuesday, October 19, 1971, 11:00 a.m.

upon this year. I should like to move now, nationally, through whatever influence my office can exert, to establish educational technology as a dependable resource to be used widely and regularly --- one might say routinely --- to effect significant and revolutionary improvement in existing forms of education.

We in education need what you in broadcasting and other technologies have to offer, very badly indeed. Employment of technology in education can no longer be thought of in terms of the future --- a vision conjured up at a world's fair and then forgotten for a decade or more. We must think in terms of now. A child cannot wait for the future in order to become educated. His needs are current and pressing. The equality we have long and loudly talked about cannot wait on another day, a more propitious time, for realization in our infinitely pluralistic and varied educational system. We must make it as uniformly just and effective as we can, and as soon as we can. And we cannot hope that our deteriorating financial situation will improve if only we wait. It may, but I wouldn't count on it.

A week or so ago the New York Times published a profile of consumer price changes from 1965 to the first half of 1971. Nearly everything has gone up considerably, as you might expect. Hospital rooms led the list: they are up 110 percent. Local transit fares are up 60 percent, movie admissions 58 percent, and so on. (I should note that one industry --- pantyhose manufacturers --- has managed to keep its prices exactly the same throughout this inflationary period. As an appreciative observer of its products, I commend this industry for its self-evident efficiency in extending its market against the counter-revolutionary forces of hip boots and maxis. But, alas, we are off the subject of the revolutionary forces

of educational technology.)

Education wasn't included in that consumer-price profile in the Times. But I did a little checking and discovered that the total cost had risen from $45.4 billion in 1965-66 --- or 6.6 percent of the Gross National Product --- to $77.6 billion in 1970-71 --- or 8 percent of the GNP.

That means that the cost of education to America has risen 70.9 percent in six years, placing it above everything except hospital rooms on the inflation roster --- and fixing it, moreover, as an object of the taxpayer's ire. The public purse, to be quite literal, is closing on our fingers. Last year, voters throughout the Nation approved only 47 percent of the school bond issues put before them --- compared with 75 percent in 1965 and 89 percent in 1960. The willingness of the people to invest their treasure unhesitatingly and unquestioningly and solely on faith for anything labeled education has come to an end. I am not at all certain when this period of public stringency will end. Perhaps never. But it is clear that whatever the level of public expenditure for education, the services bought will be much more closely examined than they have been and the results much more carefully evaluated. While education has always been viewed as having too little money to perform its tasks, and to pay teachers what they deserve, we are now being asked to become accountable for the swiftly rising dollars, and to demonstrate cost-effectiveness in our affairs. I think education can only be the better for it.

At the same time, the people are properly demanding that our classroom instruction become more individualized, more personalized, and more responsive

to the needs of the young. In the past, schools moved forward in this direction slowly and fearfully by reducing the student-teacher ratio in modest and barely discernible annual fractions. Over the past 10 years, the number of pupils per teacher in the public elementary schools has decreased by little more than three --- from 25.8 to 22.3. And the ratio is continuing to decrease with present projections suggesting that by 1978 it will be about 22 pupils per teacher. Thus, in 18 years we may have advanced individualization of instruction at a rate of 2 tenths of a teacher per year.

This is a very costly procedure. Public school current expenditures have gone up from $384 per pupil in 1959-60 to about $850 today. Two-thirds of this money goes for teachers' salaries, less than 4 percent for textbooks, teaching materials, and educational technology. Understandably, the technology industry has not been particularly impressed with the very modest number of dollars available in the education market.

Since education can scarcely become more labor-intensive that it already is without risking total financial collapse, the need for telecommunications and other forms of technology to extend, supplement, and complement the teacher's skills is clearly evident. But cost is not the only consideration. There are additional and equally compelling reasons to develop and apply new knowledge-delivery systems, reasons that take us out of the classrooms of America and into its homes and factories and business offices. The schools enroll approximately 90 percent of the population aged 5 to 19. But there are millions of potential learners who have little or no contact with the schools --- the preschooler, the dropout, the handicapped, the migrant, the unemployed, the underemployed, the elderly.

We must devise ways to give them the knowledge they want and need, for their own utilitarian purposes, for their personal fulfillment intellectually and emotionally, and for the needs and purposes of this country. We have an obligation to all. We must reach all.

Thus we are impelled by logic, by justice, and by economics to put telecommunications to work now for education, to use radio, television, satellites, and all the rest of these marvelous devices to satisfy the great hunger for learning in this country. President Nixon summed up his position on the subject when he said: "Our goal must be to increase the use of the television medium and other technological advances to stimulate the desire to learn and to help to teach." We are optimistic that with your assistance we can reach that goal within this decade. The President intends that the Federal Government will be a strong and helpful partner in the development of new low-cost delivery systems and in the conception and delivery of a whole variety of programs that will effectively serve both the in-school and out-of-school populations.

My personal experience with educational technology thus far has been, to put it mildly, dramatically encouraging. Sesame Street --- notwithstanding its Banned-in-Britain label --- is delivering sound and telling educational fare to more than seven million American preschoolers every day. Even though it cost $6.5 million to produce the initial 26-week series --- even in OE terms, this is a large contract --- the size of the viewing audience reduces the cost per student served to a remarkably low figure, on the order of one cent per child per hour --- one penny per hour for extraordinary education. I can think of no other bargain in any part of our marketplace

PS 005180

remotely approaching this kind of value. As Dean Burch, Chairman of the Federal Communications Commission, noted in an address before the International Radio and Television Society in New York, Sesame Street has become in the short time of its existence an accepted standard --- a benchmark --- among millions of parents and teachers, as well as the youngsters themselves, for measuring the quality of the children's programming on the commercial networks. Mr. Burch adds that in corporate annals, the decision of the networks not to look into Joan Cooney's ideas for an early-childhood series when they had the opportunity must rank right alongside of the decision to go ahead with the Edsel!

Come next Monday, of course, another creation of Joan Cooney and Children's Television Workshop will premiere and from the previews I've seen, The Electric Company will prove a worthy companion to Sesame Street in providing supplementary reading instruction to children in the early grades. I am very pleased that the broadcasters are scheduling Electric Company for prime time in the afternoon so that homes as well as schools can receive it. I would also mention that the premiere episode is being shown in the exhibit hall here in the hotel by the Children's Television Workshop staff.

Televised programming is also demonstrating low-cost effectiveness for the in-school population. Ripples, the early childhood awareness series initiated and coordinated by the National Instructional Television Center, is reaching about 1,500,000 students a week in the five-to-seven age group. Other NIT productions, Images and Things, and Patterns in Arithmetic, an instructional package developed by one of our OE-sponsored laboratories, are proving their value in daily use in large numbers of classrooms. These programs are demonstrating that teacher resistance to telecommunications can

be quickly reconciled if the product is worthwhile. Teachers have often been sweepingly criticized for failing to take advantage of television. I must take exception to this generalization by noting that teachers have every right to be discriminatory in what they use in their classrooms. Just because a product is on the telly does not mean that it is good. Teachers have found Sesame Street good, and I hope they will find The Electric Company equally good --- and use it!

Patterns in Arithmetic is another example of a good teaching resource. It involves the use of some new theories about ways in which children assimilate concepts of number --- and some new strategies for making those concepts stick. The approach is called the "spiral organization of subject matter." Because children differ in their readiness to assimilate an idea, spiral organization introduces a concept not once but several times, causing it to appear, disappear, and reappear at various points in the student's curriculum until his maturing intellect suddenly latches on. It is an effective idea, well presented, but just as with Sesame Street and with all successful educational research and application, it could not have been done without adequate funding.

Telecommunications authority that would greatly enhance the ability of the Office of Education to research and fund programming such as Patterns in Arithmetic and Sesame Street is, as you are aware, being cooperatively developed by HEW and the Corporation for Public Broadcasting. The Office of Education is working closely with the Office of Telecommunications Policy in the White House as well as with John Macy on this effort and we are extremely hopeful that the last wrinkles will be ironed out in a short time, enabling

the proposal to enter the legislative process. While the final specifications have not been cleared by OMB and the White House, our intentions now are to ask for broadened authority for the Office of Education in four areas:

First, to strengthen our ability to support newly developed telecommunication technologies such as satellites, cable TV, Instructional Television Fixed Service, and so forth, to permit more efficient delivery of programming as well as widening the definition of eligible grantees to include nonprofit organizations such as institutions of higher education.

Second, the legislation as presently projected would allow OE to work with State and local officials (hopefully in conjunction with other government agencies and nonprofit organizations) to develop systematic experimental hardware/software packages to meet human development needs by moving promising pilot programs to applied research stage. A good example of this kind of cooperative effort is the OE satellite experiments that we are carrying out in conjunction with the National Institutes of Health and the National Aeronautics and Space Administration.

In the first experiment we have established a unique two-way radio hookup to assist teachers in 21 remote native villages in Alaska to improve both their own skills as well as the educational fare they can offer their pupils. Actual transmissions by means of a NASA ATS-1 satellite began late last month, providing these villages, most of which are without telephone service, a combination of in-service training and other support for teachers as well as the means for conducting forums on educational health and native

cultural topics. The teachers can also use the communications system mutually to reinforce their performances by talking to each other from village to village as well as to a central source of consultants located in Fairbanks.

We are also planning to use another NASA satellite, a somewhat more complicated device that is scheduled to be launched in March 1973, for experimental educational telecasts and broadcasts to remote areas of the Rocky Mountain States, many of which are inaccessible to conventional education broadcasting. The experiments will be carried on for approximately nine months, after which the satellite will be repositioned over India where the Indian Government will use it to broadcast instructional programs four to six hours a day. I am told that 5,000 ground receivers will be installed in that country --- simple, chicken-wire affairs --- for less than $100 apiece.

The third area of the projected legislation would be planning --- enabling the Office of Education to provide State public service telecommunications authorities with grants to develop coordinated plans. We obviously require better planning of activities, measurement of need, assessment of costs, demonstration of capabilities, and evaluation of performance.

The fourth and final area is programming authority for OE. I must stress that we do not seek in any sense to compete with the Corporation for Public Broadcasting. Indeed we regard OE's educational TV arm as a small but lively component of the entire CPB spectrum. But it seems clear that the Office can serve the cause of education in an important way by obtaining authority to research and develop strictly educational software for both

home and in-school audiences as we did with Sesame Street. Individual school systems --- even individual States --- are largely incapable by reason of limited budgets and personnel resources of turning out sophisticated programming that goes beyond simple reproduction of classroom techniques. How many school systems, for example, can afford the production costs of a Sesame Street at $40,000 per hour of programming? Part of our rationale in seeking liberalized legislation is to target our resources on this type of Federal investment.

In this connection I would commend the 13 members of the NIT consortium who chipped in approximately $15,000 apiece to develop Ripples. Such sums individually will do little more than maintain poor quality programming. But the pooling of small resources permitted creation of a genuinely first-class series which is being used by the original 13 --- including, by the way, the Province of Ontario, Canada --- at an absurdly low per pupil outlay. A series on health now under development at NIT is supported by a total of 33 organizations which will supply some $450,000 to put the program together. The consortium phenomenon is growing and I would hope that other cities, States, and private institutions will see fit to adopt this technique. It seems particularly well-suited to the high-cost, high-productivity television medium.

Potential programming activities of the Office of Education are explored in a study on the subject of telecommunications which we are preparing in conjunction with NASA for the President's Domestic Council. Among its interesting speculations are possible programs on child-rearing, bilingual education, high school equivalency, career education for secondary and postsecondary students and the underemployed, teacher-training, education

of the handicapped, and an intriguing open university of the air of the kind that is operating successfully in Great Britain.

An open university could be built upon our experience in helping to support the University Without Walls, an OE project being operated by a consortium of 17 colleges and universities. This enterprise offers students from any age group a combination of internships, field experience, independent study projects, work experience and so on, all tailored to meet individual educational needs within the most flexible possible format. An open university would give consideration to prospects for higher learning such as the housewife, the convict, postman, cab driver, executive, teacher, mother --- not to mention the usual prospective college student from the traditional age group. An open university would be truly accountable to both the advantaged and the disadvantaged, encouraging not only the urban housewife to pursue her studies in English literature but also the dropout to earn his high school equivalency and then to go on to college-level work.

We have, as I mentioned, strong hopes that the telecommunications legislative proposal will be completed forthwith within the Administration, offered, and enacted promptly by the Congress. We will continue to welcome the support of the NAEB and your broadcasting bretheren as indispensable to the judicious enactment of any piece of legislation in this area as well as to its successful implementation.

Meanwhile we are using existing authorities within the Office of Education to advance the cause of educational telecommunications. In the programming area we are, of course, continuing to help fund the Children's

Television Workshop. We have committed a total of $7 million to CTW for Fiscal Year 1972. This includes The Electric Company, provided the Emergency School Aid Act passes. In the hardware end we are seeking substantially expanded funding in Fiscal Year 1973 for our Educational Broadcasting Facilities Program which, since it was established in 1962, has helped in a major way to bring the number of educational television stations currently operating or under construction to 222. The audience potential of these OE-assisted stations comes to 80 percent of the entire population and 75 percent of all elementary and secondary students. An important measure of the program's success in stimulating the growth of a strong system of noncommercial television and radio has been its "pull" in attracting non-Federal funds. Every "seed" dollar invested has attracted $16 in State, local, and private funds.

We will also be announcing in detail within a week a realignment of a number of OE components --- including technology --- under the Deputy Commissioner for Development. The overall purpose of the shift is to strengthen the capacity of the Office of Education to promote adoption of sound and valid educational research results that have been developed during the last few years but which the schools --- partially due to a confusing overlap of program authorities and paperwork requirements at our end --- have been discouragingly slow to adopt. I've sometimes wondered why local school people have been willing to put up with this kind of fragmentation. The answer, of course, is that they need the money. The amalgamation of these various programs will continue to provide that money and do so with

a far greater degree of efficiency, coordination and --- hopefully --- final instructional effect.

Separation of the technology from the library components of the Office will enable us to tie technology and telecommunications closely into the renewal strategy of the entire Office, combining machines, technology, and people into coordinated units tailored to and responsive to local conditions. Technology is obviously key to any potential program of reform and we are especially interested in the interactive capacity of cable systems to promote free exchanges between the teacher and the taught. Concepts such as the "wired city" offer mind-expanding possibilities for increasing educational productivity.

Before I close, I should like to take a moment to commend those of you who have faced the realities of civil rights in your programming, indeed who have moved ahead of the commercial networks in designing and scheduling creative shows for minority audiences. As you know, we in HEW are obliged by our various laws and authorities to assure that broadcasters who are supported to any extent with Federal funds comply with civil rights regulations. Those of you who have not yet engaged in the challenge of meeting the needs of racial and ethnic minorities, as well as those of the disadvantaged population, can learn from your colleagues who have already established a fine record in this regard.

I hope that I have conveyed to you today a sense of the commitment to educational technology that exists throughout the Administration, and particularly in the Office of Education. We intend to lay out a specific and

bold program of experimentation, demonstration, and implementation in educational telecommunication. We intend to seek support and participation from both public and private sectors and at the national, State, and local levels in order speedily to achieve the goal the President enunciated --- the employment of technology to full advantage in education. But we also recognize that our efforts will fail if they do not engage your expertise and your enthusiasm. As I said at the beginning of these remarks: we need you. We need you in broadcasting to show us in education how technology can enhance and speed the delivery of better teaching and learning.

We need to make first-quality instructional resources available through technology to every learner, transcending the monstrous differences in educational quality now prevailing. Television, properly enlarged, may be the great equalizer as we continue to press to bring our elusive dream of equal educational opportunity to reality.

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